eHealth: What's In It for Public Health?

Why should Public Health be concerned about the eHealth Initiative?

The eHealth Initiative is developing a statewide action plan to foster universal adoption and exchange of the electronic health record (EHR) – in all health care settings in Wisconsin. The goal of this action plan is to improve health care quality and patient safety.

So why should this matter to Public Health? After all, we have our own health information systems, for example, the Public Health Information Network (PHIN), Vital Records, the MCH SPHERE (Secure Public Health Electronic Record Environment) system, the Cancer Registry, and the Wisconsin Immunization Registry (WIR). And the Wisconsin Electronic Disease Surveillance System (WEDSS) is about to come on-line because an excellent commercial application has just been selected. Why should we be concerned about what the health care system does with health information?

Let's try to answer this by taking a short journey into the future.

The year is 2016. A baby is born in Milwaukee, and her universal, electronic health record (EHR) is opened, and all of the facts of her birth are recorded. She weighed in at 1900 grams, she was premature, but her Kessner index noted adequate prenatal care. She is screened for hearing loss and a substantial number of other metabolic diseases. The results of these tests are noted in her EHR. Over the next two years, her immunizations are given, each one recorded in her electronic health record. She is enrolled in the Medicaid program, and she is screened for lead poisoning during her first year of life. The results of this screening test are recorded in her electronic health record. At each clinical visit, her height and weight are recorded.

In her family history is a potential cancer risk and this too is entered into the electronic record. And so she is screened as a young adult for breast cancer. Her cancer is found at a very early stage, she is treated, and she makes a full recovery. This cancer diagnosis, staging, treatment, and disposition are all recorded in her electronic health record; this information is aggregated by researchers studying breast cancer who are able to develop improved screening and treatment protocols. When she is married at age 28, the newly-weds travel out west and camp in the Rocky Mountains for the honeymoon. After a week of wilderness camping, she experiences severe stomach cramps and diarrhea. They visit a clinic outside of the National Park and she is diagnosed with Giardia. The diagnosis and circumstances of the infection are recorded in her electronic health record – and because of a secure nationwide health data exchange system - her medical records in Milwaukee are available to her emergency health care providers in Colorado. The record notes that she works as a chef in a restaurant back home. This treatment episode is flagged and an alert is electronically transmitted to the City of Milwaukee Health Department for case follow-up.

Indeed, all of her pertinent health events are recorded in the electronic record: blood pressure, cholesterol, bone density, smoking and alcohol consumption, level of exercise, occupational history, medication and vitamin supplement use.

Only persons connected to her care can have access to this information. The Public Health system is given access to personal health information items only when allowed by statute or administrative rule. De-identified data are shared with public health on items not covered by statute or rule (e.g. smoking, alcohol behavioral risk factor surveillance, cardiovascular, asthma, and diabetes surveillance, etc.).

Access to these data is tightly controlled through a highly secure network: it provides a much greater level of security than we are able to provide for paper records. Security measures include encryption of the data as it travels across the network, login ID and Password, and two level authentication (e.g. digital certificates or biometrics – finger print or retinal scan of user). Data are provided through role based access. That is, data users can only see the minimum amount of information necessary, and no more, to perform their job. System use is monitored and audited. An electronic audit trail documents the staff viewing or interacting with each item of confidential health information.

After a long, healthy, and productive life, in 2120, she dies at the age of 104. The diseases and circumstances leading to her death are recorded and her electronic health record is closed.

In this future, it is easy to see how the electronic health record could be the basis for most of our public health information systems (Table 1). It could contain most, if not all, of the information we need to construct our birth and death vital records. It could be our source for environmental and communicable disease surveillance, and our cancer and immunization registries. It could provide comprehensive surveillance and population health data for chronic diseases – like childhood obesity, as well as behavioral risk factor data on smoking, exercise, and alcohol use.

And in this future, public health practice could take on new roles. For example, it could provide real time clinical decision support by giving views of population health information back to health care practitioners. It could warn about and display the spread and course of disease outbreaks. It could describe the geographic patterns of antibiotic and antiviral resistance. It could show the geographic completeness of screening activities. It could provide rich local public health data on chronic diseases and behavioral risk factors to better plan community and health care interventions and assess their effectiveness. In short, it could be the basis for our integrated public health information network – the first system priority of our public health plan.

Using the electronic health record would dramatically increase our efficiency, and the completeness and accuracy of our public health surveillance systems.

eHealth is important because it could greatly simplify what we do. We spend very large amounts of our time just trying to collect data, and then we spend a lot of time adjusting for the fact that it was a small sample from the population. By the time we've adjusted away, we frequently end up with small sample sizes, and too little information to apply to the group we're interested in. But what if all the information on the population we're interested in was already collected, in one place? An eHealth system collecting health data on the entire state population that then makes those data available to public health - would decrease our workload and allow us to prevent disease and disability - instead of just measure it.

But will we see this future? That depends on the level of public health involvement in the eHealth initiative back here in 2006. A strong public health voice must be added to the ongoing eHealth deliberations. We need your help to envision this future for the Governor's eHealth Care Quality and Patient Safety Board. We must describe an eHealth system that fully encompasses public health practice. We need your voices added to the board's action plan. Because eHealth will profoundly affect how we practice – or fail to practice - public health tomorrow.

To conclude: **eHealth – what's in it for Public Health? Just about everything.**

Table 1

Health Data Events and Data Systems 2006 vs 2016

Health Data Event	2006	2016
Birth	Vital Records / WAPC Application	Electronic Health Record (EHR)
New Born Hearing Loss Screening	WE-TRAC	EHR
Age 0-2 Immunizations	WIR	EHR
Cancer Screen, Diagnosis, Treatment	WI Cancer Registry, WWWCCP	EHR
Childhood Obesity, smoking, alcohol Surveillance	BRFSS – approximately 2,500 random sample telephone survey	EHR – Height & Weight Recorded at every encounter (approximately 20 million observations / yr); behavioral risk factors panel
Lead Poisoning Surveillance	Stellar; PHIN PAM	EHR
Fatal &Non-Fatal Injury Surveillance	Casepoint; VDRS; Hospital Discharge	EHR
Asthma Surveillance	Hospital Discharge	EHR
Infectious Disease Surveillance	WEDSS	EHR
Death	Vital Records Death Certificate	EHR